

REMARKS

Claims 1-24 are pending, with claims 1 and 9 being independent claim. Claims 1, 3, 4, 6, 9, 10, and 14 have been amended to even more clearly recite and distinctly claim the present invention. Claims 2 and 7 have been cancelled without prejudice to or disclaimer of the subject matter contained therein. Support for the claim amendments may be found throughout the specification, including, for example, in the original claims. Applicants respectfully submit that no new matter has been added.

Applicants respectfully request the Examiner to withdraw the outstanding rejections in view of the foregoing amendments and the following remarks.

Claim Rejections under 35 U.S.C. 112

Claims 1-8 are rejected under 35 U.S.C. 112, second paragraph, as allegedly being indefinite. Without conceding the propriety of the rejection, claim 1 has been amended to clarify the regeneration and the refrigeration phases. Applicants respectfully submit that the amendments to claim 1 obviate this rejection and respectfully request withdrawal thereof.

Claim Objections

Claims 1-24 are objected to because of informalities and claim 9 has been further objected to as being of improper dependent form. As noted above, claims 1, 3, 4, 6, 9, 10, and 14 have been amended to even more clearly recite and distinctly claim the present invention. Applicants respectfully submit that these claim amendments obviate the objections and respectfully request withdrawal thereof.

Claim Rejections under 35 U.S.C. § 102(b)

Claims 1 and 8 are rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Smith (US Patent No. 1,932,492). Applicants respectfully traverse this rejection in view of amended independent claim 1.

Without conceding the propriety of the rejections, Applicants note that claim 1 has been amended for clarity and to incorporate the features of claim 2. Claim 2 was not rejected as allegedly anticipated by Smith. Accordingly, Applicants respectfully submit that Smith

does not disclose each and every element of amended claim 1 or claim 8 which is dependent upon claim 1.

For at least the above-described reason, Applicants respectfully request withdrawal of the rejection of claims 1 and 8 under 35 U.S.C. § 102(b) in view of Smith.

Claim Rejections under 35 U.S.C. 103(a)

Claims 2, 6-7, 9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith in view of Castaing (US Patent No. 5,445,217). Applicants respectfully disagree with this rejection; therefore, the rejection is traversed.

Smith relates to a refrigerating apparatus of the absorption type. The apparatus of Smith increases the efficiency of absorption machines by utilizing the heat generated by the exothermic absorption reactor to aid in supplying liquid refrigerant to the evaporator.

Castaing relates to a cooling and heating device using a chemical reaction comprising at least four reactors.

Applicants note that claim 1 has been amended incorporating the features of claim 2. According to the method of amended claim 1, the method is implemented in a device (as set forth in claim 9) that is controlled not only by heat transfer at the reactors and the condenser, but also by selectively isolating the LT reactor from the HT reactor and the condenser. As recited in the claims, the LT reactor is thermally isolated from the ambient environment, and the LT reactor is isolated from the HT reactor at initial stage and during (at least part of) phase C. Thus, during phase C, the fluid G stays in the condenser until the beginning of phase D. This isolation provides that no relatively hot fluid G enters the LT reactor before being sufficiently cooled and the beginning of phase D. The temperature of the LT reactor can stay at a relatively low level, thereby improving the efficiency of the presently claimed method because the amount of heat to be extracted to reduce the temperature of the LT reactor is reduced (amended claim 1 and paragraphs [0034] and [0035]).

In contrast to the method of claim 1 and the device of claim 9, in Smith both the evaporator 14 and the generator-absorber 10 are connected to the condenser by conduits 11, 13, without any valve. Thus, when fluid flows from the generator-absorber 10 to the evaporator 14, it can enter the evaporator 14 **before** being sufficiently liquefied and cooled,

thereby raising the temperature of the evaporator 14. Thus, the efficiency of the production of cold in the evaporator 14 is limited.

In Castaing the reactors 14 and 16 are connected to evaporator 18 with a valve 34. Castaing discloses the use of a valve to isolate reactors from each other. However, Castaing does not disclose or suggest the use of a valve for keeping the temperature of a LT reactor, which is thermally isolated, at a lower level, thereby improving the efficiency of the cool generation.

Applicants respectfully submit that Smith in view of Castaing does not disclose or suggest the presently claimed method for rapid refrigeration. Smith in view of Castaing does not disclose or suggest at least the presently claimed regeneration step consisting of the endothermic phase of the HT phenomenon, which releases the fluid G in gas form, comprising a phase C during which the HT reactor is heated and in permanent communication with a condenser, said condenser being isolated from said reactor in which the LT phenomenon takes place during at least part of phase C; a phase D consisting in transferring the fluid G in liquid form from the condenser to the LT reactor; and a phase E consisting in cooling the HT reactor in order to return it to the initial conditions, as presently claimed.

Applicants further respectfully submit that Smith in view of Castaing does not disclose or suggest the presently claimed device for implementing a method for rapid refrigeration. Applicants respectfully submit that Smith in view of Castaing does not disclose or suggest at least a second reactor connected to a condenser via a second line provided with a valve, as presently claimed.

For at least the above-described reasons, Applicants respectfully submit that Smith in view of Castaing does not disclose or suggest the presently claimed method and device for rapid refrigeration. Accordingly, Applications request withdrawal of the rejection under 35 U.S.C. § 103(a) in view of Smith and Castaing.

Claims 3-4, 12-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith (US Patent No. 1,932,492) and Castaing (US Patent No. 5,445,217) in view of Broadbent (US Patent No. 6,205,807). Applicants respectfully disagree with this rejection; therefore, the rejection is traversed.

As described above, Smith in view of Castaing does not disclose or suggest the presently claimed method for rapid refrigeration. Smith in view of Castaing does not disclose or suggest at least the presently claimed regeneration step consisting of the endothermic phase of the HT phenomenon, which releases the fluid G in gas form, comprising a phase C during which the HT reactor is heated and in permanent communication with a condenser, said condenser being isolated from said reactor in which the LT phenomenon takes place during at least part of phase C; a phase D consisting in transferring the fluid G in liquid form from the condenser to the LT reactor; and a phase E consisting in cooling the HT reactor in order to return it to the initial conditions, as presently claimed.

Also as described above, Smith in view of Castaing does not disclose or suggest the presently claimed device for implementing a method for rapid refrigeration. Smith in view of Castaing does not disclose or suggest at least a second reactor connected to a condenser via a second line provided with a valve, as presently claimed.

Broadbent relates to an ice cube making evaporator design. Broadbent is cited as disclosing using an evaporator to form ice and also as disclosing a phase for removal of ice following refrigeration. Broadbent is further cited as disclosing an integrated ice tray.

As cited and in its full disclosure, Broadbent fails to cure the many above-noted deficiencies with regard to Smith and Castaing. The proposed combination of Smith, Castaing, and Broadbent fails to disclose or suggest the method for rapid refrigeration according to independent claim 1 or the device for implement a method of rapid refrigeration according to independent claim 9, comprising, *inter alia*, the use of a valve for keeping the temperature of an LT reactor, which is thermally isolated, at a lower level, thereby improving the efficiency of the cool generation.

For at least the above-described reasons, Applicants respectfully submit that Smith in view of Castaing and further in view of Broadbent does not disclose or suggest the presently claimed method and device for rapid refrigeration. Accordingly, Applications request withdrawal of the rejection under 35 U.S.C. § 103(a) in view of Smith, Castaing, and Broadbent.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Smith, Castaing and Broadbent in view of Shapiro (US Patent No. 6,357,720). Applicants respectfully disagree with this rejection; therefore, the rejection is traversed.

As described above, Smith in view of Castaing does not disclose or suggest the presently claimed method for rapid refrigeration. Smith in view of Castaing does not disclose or suggest at least the presently claimed regeneration step consisting of the endothermic phase of the HT phenomenon, which releases the fluid G in gas form, comprising a phase C during which the HT reactor is heated and in permanent communication with a condenser, said condenser being isolated from said reactor in which the LT phenomenon takes place during at least part of phase C; a phase D consisting in transferring the fluid G in liquid form from the condenser to the LT reactor; and a phase E consisting in cooling the HT reactor in order to return it to the initial conditions, as presently claimed.

Also as described above, Smith in view of Castaing does not disclose or suggest the presently claimed device for implementing a method for rapid refrigeration. Smith in view of Castaing does not disclose or suggest at least a second reactor connected to a condenser via a second line provided with a valve, as presently claimed.

Shapiro relates to an ice tray including mold cells each having an open top and closed bottom. Shapiro is cited as disclosing using electrical resistance elements 46 located in ice cube support trays.

As cited and in its full disclosure, Shapiro fails to cure the many above-noted deficiencies with regard to Smith and Castaing. The proposed combination of Smith, Castaing, Broadbent, and Shapiro fails to disclose or suggest the method for rapid refrigeration according to independent claim 1 or the device for implement a method of rapid refrigeration according to independent claim 9, comprising, *inter alia*, the use of a valve for keeping the temperature of an LT reactor, which is thermally isolated, at a lower level, thereby improving the efficiency of the cool generation.

For at least the above-described reasons, Applicants respectfully submit that Smith, Castaing, and Broadbent in view of Shapiro does not disclose or suggest the presently claimed method and device for rapid refrigeration. Accordingly, Applications request withdrawal of the rejection under 35 U.S.C. § 103(a) in view of Smith, Castaing, Broadbent and Shapiro.

Conclusion

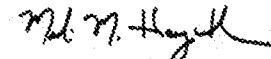
For at least the reasons noted above, the art of record does not disclose or suggest the inventive concept of the present claims.

In view of the foregoing amendments and remarks, reconsideration of the claims and allowance of the subject application is earnestly solicited. In the event that there are any questions relating to this presponse or the application, it would be appreciated if the Examiner would telephone the undersigned attorney.

If necessary for a timely response, this paper should be considered as a petition for an Extension of Time, and please charge any deficiency in fees or credit any overpayments to Deposit Account No. 05-1323 (Docket # 104011.B130129).

Respectfully submitted,

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